



Soil Health and pH Levels

Year levels 5–6

Curriculum Links

Science

- The growth and survival of living things are affected by the physical conditions of their environment (ACSSU094).
- Scientific knowledge is used to inform personal and community decisions (ACSHE217).

Location

The kitchen or the classroom

Duration:
15 minutes

Why does pH matter?

When the soil is too acid, phosphorus binds to other elements in the soil in a way that prevents plant roots from taking it in. Plants need phosphorus, and they can't get it when it is stuck to something else. The same thing happens to other trace elements that plants need, so soil that is too acidic starves the plants.

Acidic soil also inhibits beneficial bacteria that ideally grow around the plant's roots and help the plant to fix nitrogen in the soil.

These little changes can make a healthy plant yellow and weak, and susceptible to diseases and pests.

Getting started

- Revisit the class list of activities and vocabulary from the previous lesson.
- If students looked up acid-loving and alkaline (lime-loving) plants, discuss their findings.

Soil health and plant health

- Soil can be acidic or alkaline – acidic soil is sometimes called 'sour' and alkaline soil is sometimes called 'sweet' soil.
- Most plants are very sensitive to acidity and will die if exposed to very acidic or very alkaline soil.
- We make soil more acidic when we add compost, manure and other organic material.
- We make it more alkaline when we add lime (ground limestone or dolomite lime).

The pH scale

- Look at students' lists of examples of acidic foods. If someone says lemon juice is 'very acidic' and someone else says orange juice is 'very acidic', does that mean they are exactly the same? (No.)
- Ask: Okay then, how do we communicate what the acidity is?
- An international agreement is called a standard, or a scale, and it helps us to talk about a measure like acidity in confidence that we are talking about exactly the same measure.
- Introduce the pH scale and discuss students' experiences of some of the substances on the list.
- Explain that we are going to test some of the things in our kitchen but also the soil in our garden.
- Some plants prefer to grow in more acidic soil than others (blueberries, potatoes, radishes, carrots, beans and peanuts are some of the plants that love slightly acidic soil between 6 and 5.5 on the scale). Many Australian indigenous plants prefer slightly acidic soil, as much of the soil here is naturally acidic. Most of our vegetables prefer soil that is very slightly on the acid side of neutral (pH 6 to 7 – remember 7 is neutral). (An obvious point to make here is that these vegetables come from other countries, where the soil is slightly different.)
- Ask: Why would we need to know the acidity of the soil in our garden beds?
 - To ensure that we plant the kinds of plants that will grow best and produce beautiful fruit and vegetables for our garden.
 - To see if we need to add anything to the soil to help the plants that are already there.